

1987

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF COMMERCIAL FISHERIES

1987
NORTON SOUND DISTRICT
SALMON REPORT
to the
Alaska Board of Fisheries
December-1987

Nome Area Office
P.O. Box 1148
Nome, Alaska 99762

Area Management Biologist - Charles Lean
Asst. Management Biologist - Sue Merkouris

ARLIS
Alaska Resources
Library & Information Services
Anchorage, Alaska

TABLE OF CONTENTS

	Page
LIST OF FIGURES AND TABLES.....	i
BACKGROUND.....	1
District/Subdistrict Boundaries and Legal Gear.....	1
Management Objectives and Strategies.....	1
Subsistence.....	2
Salmon Distribution and Abundance.....	2
Fisheries Management.....	2
Status of Fishery and Stocks.....	4
SEASON SUMMARY (1987).....	8
Harvest, Effort, and Economic Value.....	8
SPECIAL MANAGEMENT ACTIONS.....	9
Nome Subdistrict.....	10
Moses Point Subdistrict.....	10
Shaktoolik and Unalakleet Subdistricts.....	10
OUTLOOK FOR 1988.....	11
POTENTIAL MANAGEMENT PROBLEMS.....	12
Nome Subdistrict.....	12
Unalakleet Subdistrict.....	13

LIST OF FIGURES

<u>Figure</u>	<u>Page</u>
1. Norton Sound commercial salmon fishing subdistricts.....	14
2. Statistical areas of the Moses Point commercial salmon fishing subdistrict, Norton Sound.....	15

LIST OF TABLES

<u>Table</u>	<u>Page</u>
1. Commercial salmon catches by species, Norton Sound District, 1961-1987.....	16
2. Norton Sound commercial salmon harvest and effort by subdistrict, 1987.....	17
3. Norton Sound salmon value and average price paid to the fishermen by species, 1987.....	18
4. Aerial survey counts of Norton Sound streams, 1987.....	19
5. Kwiniuk Tower expanded chum and pink salmon escapements, 1965-1987.....	20

BACKGROUND

District/Subdistrict Boundaries and Legal Gear

The Port Clarence District includes all waters from Cape Douglas north to Cape Prince of Wales (Figure 1).

The Norton Sound District includes all waters from Canal Point Light north to Cape Douglas. The district is comprised of six subdistricts: Nome (subdistrict 1), from Penny River to Topkok Head; Golovin Bay (subdistrict 2), from Rocky Point to Cape Darby; Moses Point (subdistrict 3), from Elim Point to Kwik River; Norton Bay (subdistrict 4), from Kuiuktulik River to Island Point; Shaktoolik (subdistrict 5), from Cape Denbigh to Junction Creek; and Unalakleet (subdistrict 6), from Junction Creek to Black Point (Figure 1). Set gillnets are the only legal commercial fishing gear.

Management Objectives and Strategies

The Division of Commercial Fisheries of the Alaska Department of Fish and Game manages commercial and subsistence fisheries in Norton Sound and Port Clarence. The main objective of the Department's program is to manage the fishery resource on a sustained yield basis in accordance with policies set forth by the Alaska Board of Fisheries, with subsistence fishing the highest priority among beneficial uses of the resource. Spawning escapements in major rivers are monitored through aerial surveys, counting towers, and a test fishing project. Escapement goals or levels have been set for most index streams to assure a sustained yield based on historic escapements and returns. In most cases escapement goals can be achieved through scheduled weekly closures of the commercial fishery, but weekly closures of the subsistence are required in the Nome subdistrict and Port Clarence district. Subsistence fishing in the Nome subdistrict is monitored by requiring the return of the return of the subsistence permit catch calendar. In the past annual subsistence surveys were conducted in the villages of both subdistricts but that program was curtailed due to budgets cuts during FY85.

Commercial salmon fishing in the Port Clarence District has been prohibited since 1967. In 1966 a total of 1,216 salmon consisting of 93 sockeye, 131 pink, and 992 chum salmon was taken commercially in the Grantley Harbor/Tuksuk Channel area. This was the only bona fide commercial fishery, but a few salmon are sold or bartered each year in Teller and Nome. Due to the relatively small runs in this area and the existence of an important subsistence fishery, commercial salmon fishing has not been reopened.

Subsistence

Subsistence fishing is allowed seven days a week in both marine and river waters of subdistricts 2-6 with no catch limits. In the Nome subdistrict where subsistence as well as commercial fishermen must be limited by periodic closures and catch limits so that escapement goals may be reached. Due to increased access, effort, and limited chum and coho salmon stocks in local streams, subsistence fishing has been conducted in the Nome subdistrict on a permit system since 1974. Subsistence fishermen are required to record the number of fish taken by permit and return it at the end of the season thereby documenting the harvest. The permit system also distributes fishing effort by limiting the number of fish each family can harvest from each river. Nome subdistrict streams have permit catch limitations ranging from 100 to 250 salmon, depending on stock strengths and historical effort, with further limits of no more than 20 chum and 20 coho from the Nome and Snake Rivers. There is no catch limit in marine waters. Fishing is restricted by regulation to 4 days per week from June 15 through August 31.

In the past, additional restrictions have been necessary in the Nome subdistrict to achieve chum salmon escapement goals. During the 1985 season, portions of the Nome River were closed to salmon sport fishermen and subsistence (net) fishermen alike, to enhance chum salmon escapement. During 1986, subsistence salmon fishing was allowed to run on the normal 4 days per week schedule in the Nome subdistrict. In 1987, most Nome area streams were closed to sport and subsistence fishermen during two weeks in July to enhance salmon escapements.

Salmon Distribution and Abundance

All five species of Pacific salmon occur in Norton Sound. Generally, pink salmon are the most abundant followed by chum, coho, and chinook salmon. Sockeye salmon occur only rarely. Chum salmon are generally the most economically important species followed by chinook, coho, pink and sockeye salmon, respectively.

Each subdistrict contains at least one major salmon spawning stream. Commercial fishing effort occurs in marine waters, usually near stream mouths. Subdistrict boundaries were established around the most productive salmon streams to minimize interception of stocks bound for other areas. Subdistricts are managed independently based on the status of local stocks and fisheries.

Fisheries Management

Regulations provide for the commercial fishing season to be opened by emergency order between June 8 and June 20. The arrival of salmon in Norton Sound is greatly influenced by

breakup, and the season is not opened until salmon have started their upstream migration as documented by reports of increasing subsistence catches, and river test fishing indices. The timing and abundance of the chinook salmon run is monitored in Unalakleet by a fisheries biologist operating a test net in the Unalakleet River. Subsistence effort and chinook salmon catches are monitored daily to assure that subsistence needs are being met before the commercial fishery is opened.

Under normal breakup conditions, the commercial season is opened on June 15, the midpoint of the opening date range set by regulation, on a subdistrict by subdistrict basis. Subsistence catches and escapement indices are monitored so that the first commercial openings will occur roughly one week after the salmon migration begins. If the season is opened early, initial fishing periods may be only 24 hours in duration until additional run strength information is obtained. If an early or late breakup occurs, the season will be opened before or after June 15, the exact date based on run timing and abundance. The published fishing schedule is four days a week, 6:00 pm Monday to 6:00 pm Wednesday and from 6:00 pm Thursday to 6:00 pm Saturday.

The exception to this schedule is in the Nome subdistrict where in recent years intense fishing pressure, small local stocks, or expected poor returns have resulted in decreased fishing time. The Nome subdistrict is opened on or after July 1, by regulation. Commercial fishing in the Nome subdistrict has been closed when the regulatory 5-15,000 chum harvest guideline for this subdistrict has been reached.

Adjustments in fishing time for other subdistricts may be required for conservation purposes if returns are below average and fishing effort remains high. Effort, catch, and escapement data are compared with previous seasons to judge relative run magnitudes during the current season.

The pink salmon return usually begins in early to mid-July, shortly after the chinook and chum returns have started to peak. When exceptionally large pink salmon runs occur, additional fishing periods are provided when only gill nets with a maximum of 4 1/2" mesh may be used. These additional fishing periods, coupled with mesh restrictions, are an attempt to allow for the harvest of surplus pinks without overharvesting chum stocks. A regulation adopted in 1981 provided fishermen with the option of setting or drifting their 4 1/2" mesh gill nets during these special periods. Pink salmon gear takes fewer chum salmon, but of the chums caught, a higher percentage are female. In subdistricts where low chum salmon escapements are occurring, additional pink gear periods are delayed until most chum salmon have entered spawning streams. These additional openings with small mesh gill nets are usually terminated about August 1 after the pink return has greatly diminished.

Coho salmon return during August. All subdistricts, except the Nome subdistrict, are scheduled by regulation for two 48-hour fishing periods per week at this time. The Nome subdistrict commercial fishery is scheduled for two 24-hour periods per week during August due to intense subsistence and sport fishing pressure on local stocks which are not abundant.

STATUS OF FISHERY AND STOCKS

Chinook Salmon

There is a directed chinook salmon fishery in the Shaktoolik and Unalakleet subdistricts where fishermen target on this species with the use of large mesh (6 7/8" - 8 1/2") gear. Historically, commercial quantities of chinook salmon have not occurred north of the Shaktoolik subdistrict; however, increasing annual harvests of chinook salmon in the Norton Bay and Moses Point subdistricts indicate a trend of range expansion for this species. The bulk of the commercial chinook salmon harvest normally occurs from approximately June 15-July 5.

During the first three years of the fisheries, (1961-1963), annual catches averaged about 6,000 chinook. The following 14 years (1964-1977) the commercial catch averaged about 2,000 chinook. Since 1978, the average annual chinook salmon catches have increased to about 9,500 fish, however the 1987 catch of 7,080 was 25% below the previous nine year average. Subsistence catches have also increased, and have averaged 1,300 chinook for the most recent 6 years that subsistence salmon harvests were documented (1979-1982, 1985). Escapement data for chinook salmon are limited to a few escapement projects and aerial surveys on select systems.

Table 4 lists aerial survey and tower escapement counts in the major index streams of Norton Sound. In general, weather conditions were fairly cooperative during 1987. Lower levels of rainfall than normal kept stream water levels comparatively low. However, survey efforts were hindered by the lack of adequate, experienced staffing in Norton Sound. Peak surveys were obtained on an opportunistic basis when the duties of the management of the Kotzebue salmon fishery allowed the area biologist to be present in Norton Sound or when experienced regional staff biologists could break free to assist in conducting peak count surveys. Many non-peak and closure monitoring surveys were obtained by the less experienced observers of the Norton Sound staff.

Chinook escapements in the Unalakleet River system and Shaktoolik River were roughly half the goals set for these rivers. Only the Unalakleet and Shaktoolik have goals set for chinook salmon

escapement. Good chinook counts were documented in the Inglutalik River of the Norton Bay subdistrict. The Kwiniuk River (Moses Point subdistrict) counting tower documented fewer chinook salmon than in recent years but 1987 was the 3rd best year on record. The Tubutulik River chinook escapement was above average. In the Golovin subdistrict, the chinook producing Boston Creek had record escapement as documented by aerial surveys, with average escapement observed on the Fish River (Table 4).

Chum Salmon

Chum salmon is the primary commercial species throughout Norton Sound. Most of the chum salmon commercial harvest occurs from approximately June 25 - July 20. Catches were large during the first four years of the fishery (1961-1964) averaging about 134,000 fish annually. Annual catches dropped to an average of 66,000 fish during 1965-1970. Since 1970 chum catches have stabilized somewhat, averaging about 162,000 fish per year. Documented subsistence catches have ranged from 4,000 to 33,000 chum salmon. Subsistence catch estimates are not as accurate as commercial catch figures due to the methods by which they are collected. During years when funding has been available (1963-1982), subsistence salmon catches were documented by door-to-door, personal interviews of fishermen. During these surveys, not all fishermen are contacted nor do all subsistence fishermen "count" their harvests; some estimates are based on the number of "bundles" or "strings" of fish. In addition some species misidentification exists. Therefore, documented subsistence harvests are minimum estimates.

As stated in the previous section, peak surveys for chum salmon were obtained during the 1987 season on an opportunistic basis. The Nome subdistrict of Norton Sound received the most intensive survey efforts, with multiple aerial stream surveys being conducted as well as two boat surveys of the Nome River. Salmon stocks local to the Nome area are limited, easily accessed (extensive road system) and exposed to intensive subsistence and sport fishing pressure.

Chum salmon escapements in the Nome subdistrict appeared to be average to below average. In the Nome River, the highest chum count (1,646) was obtained during a July 14 aerial survey, before peak spawning activity. It is unlikely that the escapement goal of 2,000 chum salmon was attained. A survey flown on July 27 documented fewer chum (1,193) and observed pink salmon in the lower portion of the stream. In the remaining Nome area streams, above average (1.25 times the goal) chum escapement was documented in the Sinuk River and chum escapements were roughly two-thirds the goals set for the Flambeau, Eldorado, Bonanza, Snake and Solomon Rivers (Table 4).

Chum salmon escapements appeared to be two-thirds the goals set for Golovin subdistrict streams (Fish, Niukluk, Boston) although peak surveys were not attained. Chum escapements in the Moses Point subdistrict were also one-third below the goals set for the Kwiniuk River and Tubutulik River. A commercial fishery closure in this subdistrict did bolster the Kwiniuk River counts but failed to reach the goal of 20,000 chum. A peak survey of Tubutulik River was not attained.

Chum salmon escapements in the Norton Bay subdistrict appeared average overall. Although there are no set goals established for the Ungalik and Inglutalik Rivers of this subdistrict, above average peak chum counts were obtained on the Ungalik River during late July. Conversely, a below average peak chum count was documented for the Inglutalik River.

Chum salmon counts of the Shaktoolik River were far below average. This subdistrict was closed to commercial fishing from July 19 through 26. A July 28 survey documented few (471) chum salmon in the Shaktoolik River. Further commercial closures were implemented, however, no further chum salmon escapement counts were obtained.

Chum salmon escapements in the Unalakleet subdistrict appeared to be below average. Commercial fishing was restricted in this subdistrict as it was in the Shaktoolik subdistrict. The upper Unalakleet River system experienced below average escapement; the lower river is characteristically unsurveyable; the North River had far below average escapement. Chum salmon catches in the Unalakleet River test net were also below average, roughly one-half to one-third the catch rate of any of the previous five years.

Pink Salmon

A trend of elevated even year pink salmon returns has become evident since 1978. With odd year returns having experienced severe winter conditions in 1981 and 1983, the result has been the development of an odd/even year cycle with weak odd year returns of pink salmon in Norton Sound. During strong, even year returns, the bulk of the commercial fishing has occurred from July 1-July 10.

Because of near record parent year escapements throughout Norton Sound in 1984, and expected good egg survival the following winter, the 1986 pink salmon return was expected to be very strong. However, the return in 1986 was generally just average when compared to the last 5 years and one-third below average when compared to the even year returns since 1980. Commercial pink salmon harvests in the Golovin and Moses Point subdistricts, where a market was present, were also one-third below average. Special small mesh openings were allowed in these subdistricts

from July 2 through July 9; pink salmon harvests were much less than expected and the high incidental harvest of chum salmon in the Moses Point subdistrict led to an early closure of these openings.

The 1987 pink salmon return was expected to be at very low levels based on the very weak parent year return in 1985. These expectations proved to be correct. A pink salmon market was present in all fishing subdistricts with the exception of the Nome subdistrict during 1987. Even with the presence of a market, the 1987 pink salmon harvest was the lowest on record since 1965. Pink salmon captures in the commercial fishery (but kept for personal consumption) were reported to be rare compared to recent years (Table 1).

Few pink salmon were documented during the chum and chinook salmon surveys. The best pink salmon counts were made in the Norton Bay subdistrict Ungalik and Inglutalik Rivers. The highest count of pink salmon on the Nome River occurred during a boat survey in mid-August of the lower river (Osborne to mouth). Low water levels prevented further upriver boat travel. Without exception, pink salmon escapements throughout the Norton Sound district were very low less than one-tenth the previous year (Table 4).

Coho Salmon

The commercial salmon fishery targets on coho during August and September; normally, most of the commercial coho harvest occurs between August 7 and August 31. Commercial coho salmon catches averaged about 6,000 fish from 1961-1978. Returns increased greatly during the next eight years when the average annual catch for the 1979-1986 period was 45,000 fish. The 1987 commercial coho salmon catch of 24,279 was 46% below the recent five year average.

The major coho producing streams in Norton Sound are also in the Shaktoolik and Unalakleet subdistricts, although coho salmon are found in nearly all of the chum producing streams throughout the district. Because of the inclement weather normally experienced in this area during August and September, escapement data from all subdistricts is somewhat sketchy. This year, however, coho salmon counts were documented in more streams than usual. Most counts were obtained under marginal weather and aerial viewing conditions. Some surveys (Ungalik and Shaktoolik) were found to have been flown well past peak spawning.

In general, coho salmon escapements throughout the Norton Sound district appeared adequate. Without a historical data base, derivation of goals and escapement averages has not been possible.

Table 4 summarizes coho salmon counts for the streams that were surveyed. The Kwiniuk River count (819) was mid-way between the only other observations of 673 in 1985 and 983 in 1984. The count of 746 is the first ever documentation of coho salmon escapement in the Shaktoolik River. The Unalakleet River counts were well below the escapement documented during the record return of 1982 (3,648), but were comparable to counts attained in 1980, 1981, and 1984. The North River also experienced a coho escapement comparable to all documented past years with the exception of 1982 record return escapement levels. Again, it must be emphasized that most surveys were flown under marginally acceptable conditions.

SEASON SUMMARY (1987)

Harvest, Effort, and Economic Value

For the fourth consecutive year, due to the late timing of the salmon returns, the season opening was delayed. The Golovin, Moses Point, and Norton Bay subdistricts opened June 22 for 48 hours; the Shaktoolik and Unalakleet subdistricts opened June 22 for 24 hours; the Nome subdistrict opened July 2 for 24 hours. The season, which closes on August 31 by regulation in subdistricts 1, 2, and 3, closed on August 28 in subdistrict 1 and August 29 in subdistricts 2 and 3 to allow for normal period scheduling. The season, which closes on September 7 by regulation in subdistricts 4, 5, and 6 closed on September 4 in subdistricts 5 and 6, and on September 5 in subdistrict 4 to allow for normal period scheduling (Figure 1).

The 1987 Norton Sound commercial salmon harvest totaled 136,283 fish, which was comprised of 7,080 chinook, 207 sockeye, 24,279 coho, 2,260 pink, and 102,457 chum salmon (Table 2).

The chinook harvest was 30% and 21% below the recent 5 and 10 year averages, respectively. The coho harvest was 45% and 65% below the recent 5 and 10 year averages, respectively. The pink harvest was 98% and 99% below the recent 5 and 10 year averages, respectively. This low pink salmon harvest was again (as in 1985 and 1986) due to a weak return rather than the lack of a market. The chum harvest was 45% and 43% below the recent 5 and 10 year averages, respectively. Historical catch data for the Norton Sound district is presented in Table 1.

A total of 198 CFEC permits were renewed, with 164 actually fished during the 1987 season. Looking at the Norton Sound district as a whole, fishing effort has been fairly stable, averaging about 164 fishermen since limited entry was put into effect in 1976.

Two domestic processors operated in Norton Sound during 1987. In addition, a joint venture between KEG (Koyuk-Elim-Golovin), 3NC Corporation, and NPL Alaska, Inc., operated during the 1987 season. Under a permit issued by the Governor, three Japanese freezer ships were authorized to buy Norton Sound salmon directly from domestic fishermen. Their operations were limited to internal waters of Golovin and Norton Bay for processing of all salmon species caught in the aforementioned internal waters. Additionally, the joint venture ships were permitted to process pink salmon (only) purchased directly from domestic fishermen fishing the newly designated internal waters of the Shaktoolik and Unalakleet subdistricts. In 1987, two freezer ships operated in Norton Sound and as in past years, were located in Golovin Bay and in Norton Bay near Moses Point. Because of a weak pink salmon return, no deliveries were made by Shaktoolik nor Unalakleet fishermen to the joint venture vessels. In addition to these sanctioned buyers, a domestic processor flew in to Moses Point one day early in August and purchased a few chum and coho salmon. This buyer never contacted Department personnel in Nome nor Unalakleet. His activities were documented only by Fairbanks Department staff who forwarded fish tickets received late in August. Attempts to contact a company representative were unsuccessful. A few fishermen from the Nome and Shaktoolik subdistricts also sold chinook, chum, and coho salmon locally as permitted under catcher-seller status.

Commercial fishermen received approximately \$504,631.00 for their catch. This is the lowest dollar value on record since 1976 and was 39% below the recent 5 year average of \$822,048.00. This low dollar value is attributed to below average catches of all salmon species. Prices paid to the fishermen averaged \$1.11 per pound for chinook, \$1.03 per pound for sockeye, \$0.57 per pound for coho, \$0.20 per pound for pink, and \$0.33 per pound for chum salmon. These data are summarized in Table 3.

During 1987, no funds were made available for subsistence surveys in the Norton Sound district. Subsistence salmon permits are required in the Nome subdistrict. In 1987, 227 permits were issued; preliminary harvest totals from 189 permits returned to date are 195 chinook, 102 sockeye, 930 coho, 910 pink, and 9,848 chum salmon.

SPECIAL MANAGEMENT ACTIONS

Chum salmon escapement was again a major concern in the Nome and Moses Point subdistricts. In addition, the Shaktoolik and Unalakleet subdistricts became areas of increasing concern as peak survey counts were found to be critically low to below average.

Nome Subdistrict

In the Nome subdistrict, regulations adopted during the 1984 Board of Fisheries meeting were in effect. These regulations severely restricted Nome commercial fishermen and to a lesser degree, sport fishermen and subsistence fishermen. However, even with reduced quotas and bag limits, further restrictions were necessary on these user groups. An added problem was low abundance of pink salmon which during most years helps absorb fishing pressure. By mid-July it was apparent that the chum (and pink) salmon returns were at very low levels. On July 15, two emergency orders were issued. The first closed salmon sport fishing from midnight, July 15 through August 2 in the Cripple, Penny, Snake, Nome, Flambeau, Eldorado, Bonanza, and Solomon Rivers of the Nome subdistrict. The second closed inriver subsistence net salmon fishing in the aforementioned streams, for the same time period. It should also be pointed out that the marine waters (with no catch limits) as well as the Sinuk River (with an above average chum return) were unaffected by this closure. Subsequent aerial and boat surveys showed that even with such drastic, restrictive measures, overall chum (and pink) escapements were below average.

Moses Point Subdistrict

In the Moses Point subdistrict, it became apparent inseason that average chum escapement would not be reached without commercial fishery restrictions. The entire subdistrict was closed by emergency order from July 17 until August 2 to bolster below average chum escapements in the Kwiniuk and Tubutulik Rivers (Figure 2). Preliminary expanded chum counts on the Kwiniuk River (Table 4) indicated average escapement was not attained. Subsequent documentation of the Tubutulik River was not attained.

Shaktoolik and Unalakleet Subdistricts

Chinook, chum, pink, and coho salmon escapements were all of major concern in both the Shaktoolik and Unalakleet subdistricts. The combined fishing pressures of commercial, sport, and subsistence users (especially in the Unalakleet River system), in addition to the difficulty in attaining timely, quantitative escapement information, has complicated proper management of these fisheries. With current staffing levels, even peak survey counts are very difficult to obtain. Lack of observers, inadequate funding, and problems associated with coordinating a plane/pilot charter with acceptable weather conditions, resulted in few surveys that could be used inseason. The result was that the management of the fisheries relied more heavily on "subjective" information, i.e. local reports of fish in rivers.

The Department test net on the Unalakleet River proved to be very useful during 1987. Although this type of sampling does not give

a quantitative measure of escapement magnitudes, it did provide an important relative measure of abundance and return timing when compared to previous years' test net catches. Catches in the test net did show below average returns of all species of salmon, as well as corresponding increases in catches during commercial, sport, and subsistence fishery closures or restrictions. All data seems to point to the fact that peak aerial survey data is not useful for making timely inseason management actions. Rather, it yields a post season measurement of the effectiveness of management actions. It would seem, then, that before a comprehensive management plan for these subdistricts can be successful, development of an inseason escapement index program must be provided.

During the 1987 season, the following management actions were implemented in the Unalakleet and Shaktoolik subdistricts to increase salmon escapements: Commercial fishing time during the chinook return was restricted to 24 hour periods in Shaktoolik (through June 26) and in Unalakleet (through July 3). In addition, three 48 hour periods were cancelled in both subdistricts (7/20-7/22, 7/23-7/25, and 8/20-8/22) to enhance chum, pink, and coho salmon escapements. On August 24, both subdistricts were placed on a reduced fishing schedule of 36 hour periods until the season's end on September 4.

In addition to the commercial fishery restrictions, sport and subsistence closures and restrictions were put into affect: The Shaktoolik and Unalakleet drainages were closed to sport fishing for chum, pink, sockeye, and coho salmon from July 22-July 29; on July 29, a sport fish closure on chum, pink, and sockeye salmon was re-instated in the Shaktoolik and Unalakleet drainages for the remainder of the year. This second sport fish closure followed surveys in these two drainages on July 28 which documented low level chum and pink salmon escapements. Also following this survey, subsistence fishing in the Unalakleet River was closed for two 5 day periods, from August 3-7 and from August 10-14.

OUTLOOK FOR 1988

Insufficient data are available to enable reliable forecasting methods to be employed in Norton Sound. The 1988 "outlook" is based upon analysis of comparative escapement and commercial catch information, age data, and "subjective determinations". This outlook is presented only as an indicator of possible 1988 return strength.

The chinook salmon return will be determined by the 1982 and 1983 brood years. The 1982 chinook return was below average. In contrast, the 1983 chinook return was above average. A commercial harvest of 6,000 to 10,000 chinook is expected in 1988.

The 1988 pink salmon return will be the progeny of the 1986 brood year, which was approximately one-half the magnitude of its' 1984 parent year. Because frost levels in 1986 appeared normal, the 1988 return of pink salmon is expected to be similar to the 1986 return. A commercial harvest of 20,000 to 60,000 pink salmon is most likely, depending on markets.

The chum salmon return will be primarily produced by the 1984 brood year which was average to slightly above average. Frost levels during the winter of 1984-85 appeared normal, therefore the chum salmon return in 1988 may be "average", providing a commercial harvest between 160,000 and 200,000 chum salmon.

The 1988 coho salmon return will be produced by the 1984 brood year return which yielded the second highest commercial harvest on record. If inriver survival conditions were good, the return of coho salmon in 1988 is expected to produce a commercial harvest between 30,000 to 90,000 fish.

POTENTIAL MANAGEMENT PROBLEMS

Nome Subdistrict

The cumulative fishing pressure of commercial, subsistence, and sport fishing on local stocks, which are less abundant than in other portions of Norton Sound, requires special management strategies. Unlike other subdistricts, nearly all the spawning streams are accessible by road to subsistence and sport fishermen. During the last five years, an average of 219 permits have been issued yearly for subsistence fishing in the Nome subdistrict. Reported subsistence harvests have averaged 18,400 salmon during the past 5 years. In 1987, 227 permits were issued; preliminary catch totals from the 189 permits returned to date reported a harvest of 9,894 salmon. The commercial fishery, which targets on chum salmon during most years, must be managed very conservatively due to the importance of subsistence fishing, the limited abundance of local chum salmon stocks and the interception of other stocks bound for Kotzebue Sound, Port Clarence and eastern Norton Sound fisheries.

The 1988 pink salmon return is expected to be average to below average. There is concern that the recent trend of reduced pink salmon returns will contribute to potential overexploitation of chum salmon stocks in the Nome area streams by sport and subsistence fishermen alike. This may cause restricted fishing schedules for all users in area streams as was experienced during the 1987 season.

Unalakleet Subdistrict

Increased subsistence fishing effort has been observed in the lower Unalakleet River for the past 5 years during the chinook salmon return. As many as 30 nets have been observed in the first mile of the river. There is concern that this large effort may reduce escapement to such a degree that the reproductive potential of the stock may be damaged. An additional complication to the proper management of the chinook directed fisheries are the reports of undocumented sales of river caught fresh chinook and processed chinook salmon strips. If escapement levels appear low and a high number of subsistence nets are observed in the lower Unalakleet River, further restrictions in commercial fishing time may be necessary in the 1988 season.

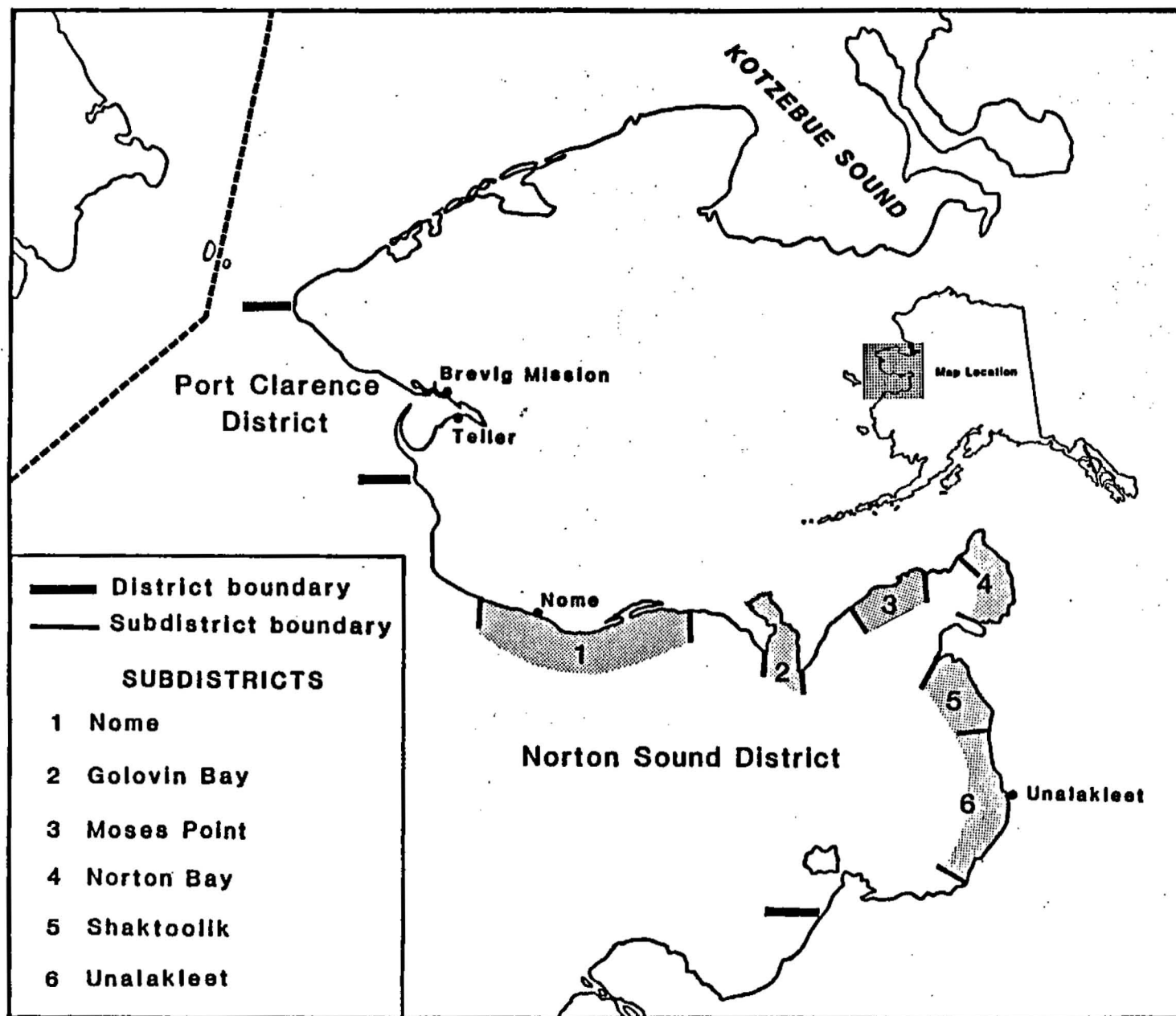


Figure 1. Norton Sound commercial salmon fishing subdistricts.

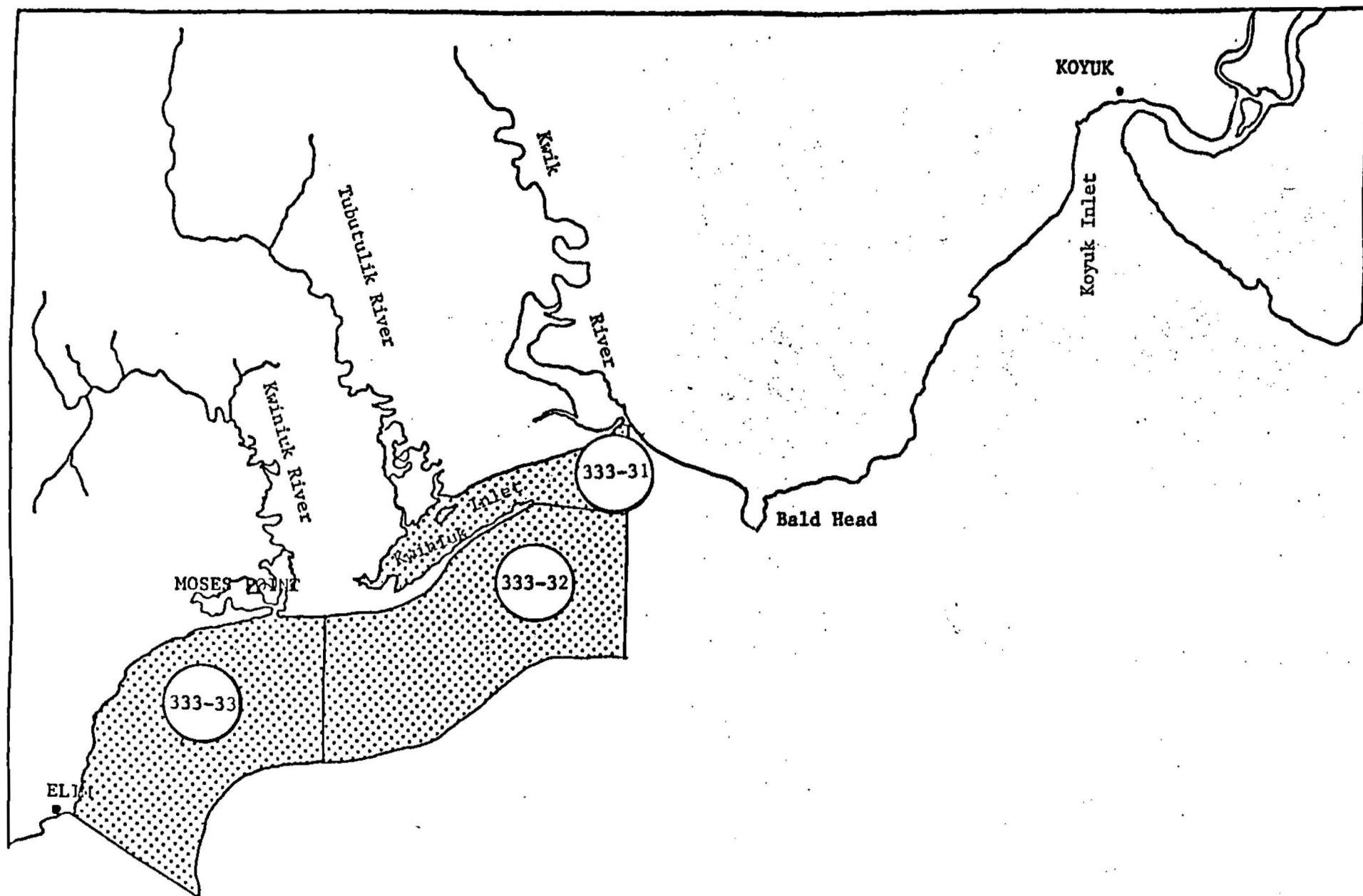


Figure 2. Statistical areas of the Moses Point commercial salmon fishing subdistrict, Norton Sound.

Table 1. Commercial salmon catches by species, Norton Sound District, 1961-1987.

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1961	5,300	35	13,807	34,327	48,332	101,801
1962	7,286	18	9,156	33,187	182,784	232,431
1963	6,613	71	16,765	55,625	154,789	233,863
1964	2,018	126	98	13,567	148,862	164,671
1965	1,449	30	2,030	220	36,795	40,524
1966	1,553	14	5,755	12,778	80,245	100,345
1967	1,804	---	2,379	28,879	41,756	74,818
1968	1,045	---	6,885	71,179	45,300	124,499
1969	2,392	---	6,836	86,949	82,795	178,972
1970	1,853	---	4,423	64,908	107,034	178,218
1971	2,593	---	3,127	4,895	131,362	141,977
1972	2,938	---	454	45,182	100,920	149,494
1973	1,918	---	9,282	46,499	119,098	176,797
1974	2,951	---	2,092	148,519	162,267	315,829
1975	2,393	2	4,593	32,388	212,485	251,861
1976	2,243	11	6,934	87,916	95,956	193,060
1977	4,500	5	3,690	48,675	200,455	257,325
1978	9,819	12	7,335	325,503	189,279	531,948
1979	10,706	---	31,438	167,411	140,789	350,344
1980	6,311	40	29,842	227,352	180,792	444,337
1981	7,929	56	31,562	232,479	169,708	441,734
1982	5,892	10	91,690	230,281	183,335	511,208
1983	10,308	27	49,735	76,913	319,437	456,420
1984	8,455	6	67,875	119,381	146,442	342,159
1985	19,491	166	21,968	3,647	134,928	180,200
1986	6,303	233	35,600	41,260	146,912	230,308
1987	7,080	207	24,279	2,260	102,457	136,283
5-Yr Avg. 1/ 10,108		88	53,374	94,296	186,211	344,077
10-Yr Avg. 2/ 8,981		61	37,074	147,290	181,208	374,613
1/ 1982-1986						
2/ 1977-1986						

Table 2. Norton Sound commercial salmon harvest and effort by subdistrict, 1987.

Subdistrict	Fisher- men	Chinook	Sockeye	Coho	Pink	Chum	Total
Nome	10	3	0	577	0	5646	6226
Golovin	21	166	51	2203	1579	44334	48333
Moses Point	34	907	15	64	568	17278	18832
Norton Bay	12	544	0	145	16	3586	4291
Shaktoolik	39	2214	0	6193	0	14088	22495
Unalakleet	65	3246	141	15097	97	17525	36106
District Totals	164 1/	7080	207	24279	2260	102457	136283

1/ Several fishermen fished more than one subdistrict.

Table 3. Norton Sound salmon value and average price paid to the fishermen, by species, 1987.

Species	Dollar value	Average price paid
Chinook	\$ 156,436.00	\$ 1.11
Sockeye	1,447.00	1.03
Coho	100,879.00	0.57
Pink	1,828.00	0.20
Chum	244,541.00	0.33

Total	\$ 504,631.00	

1/

1/ Lowest dollar value since 1976 and was 39% below the recent five year average.

Table 4. Aerial survey counts of Norton Sound streams, 1987.

Subdistrict	Stream	Chum Goal	Observed			
			Chum	Pink	Chinook	Coho 2/
Nome (1)	Sinuk 1/	3,500	4,540	30	5	230
	Snake	-	267	0	0	163
	Nome	2,000	1,646	1,400 3/	3	419
	Flambeau	4,500	115	0	0	-
	Eldorado	6,000	3,860	130	6	108
	Bonanza	-	190	0	0	-
	Solomon	-	135	0	0	-
Golovin (2)	Fish	16,000	7,886	0	193	-
	Niukluk	12,500	4,145	0	10	257 4/
	Boston	2,500	3,640	0	583	-
Moses Pt. (3)	Kwiniuk 5/	25,000	16,134	5,567	314	819 6/
	Tubutulik	14,000	9,605	580	474	-
Norton Bay (4)	Inglutalik 1/	-	3,962	8,000	945	-
	Ungalik 1/	-	3,918	6,000	44	20 7/
Shaktoolik (5)	Shaktoolik 1/	11,000	471	0	386	746
Unalakleet (6)	Unalakleet System	-	623	0	476	1,042
	North River 1/	2,500	392	0	445	680

- 1/ Peak chum salmon counts
 2/ Most coho surveys flown under poor conditions
 3/ Boat survey count
 4/ Includes counts from Ophir Creek
 5/ Expanded tower counts

- 6/ Aerial survey count
 7/ Unacceptable conditions
 8/ Partial survey; includes counts from Old Woman

Table 5. Kwiniuk Tower expanded chum and pink salmon escapements, 1965-1987. 1/

Year	Chum	Pink
1965	32,861	8,668
1966	32,182	10,864
1967	26,661	3,587
1968	18,976	129,052
1969	19,749	57,497
1970	68,004	235,131
1971	38,679	16,634
1972	30,686	62,461
1973	28,617	38,426
1974	35,899	40,816
1975	14,344	57,317
1976	6,466	28,087
1977	22,289	44,602
1978	11,049	70,148
1979	12,355	167,492
1980	19,374	319,363
1981	34,561	566,417
1982	44,099	469,674
1983	56,907	251,965
1984	54,043	736,544
1985	9,912	22,548
1986	24,704	241,446
1987	16,134	5,567

1/ Chum salmon escapement goal for Kwiniuk River is 25,000 fish.